REMARKS

An Office Action was mailed on January 7, 2004. Claims 1, 2 and 4 – 6 are currently pending in the application.

REJECTION UNDER 35 U.S.C. §§ 102, 103

Claims 4 - 5 are rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,481,526 to Nagata et al. Claims 1, 2 and 4 – 6 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,097,688 to Ichimura et al. in view of Nagata. Applicant respectfully traverses these rejections.

In our Response to Office Action of April 26, 2004, Applicant made the following arguments:

> In independent claims 1, 2, 4, 5 and 6, Applicant discloses a focus control apparatus, an optical disk playback system including the focus control apparatus, a focus control method and a program product storing a program executed by an optical disk playback apparatus for controlling the focus of an objective lens focusing light against an optical disk having a plurality of recorded layers. Significantly, the playback apparatus may be operated: a) to obtain an intermediate value from a maximum value and a minimum value of a focus error signal which corresponds to defocusing of the objective lens, and which is generated by a certain one of the recorded layers, and b) to turn on a focus servo which pulls in a focus of the objective lens, with a bias at which the focus error signal corresponds to the intermediate value, when a layer jump is made to another recorded layer in order for the focus servo to perform an automatic adjustment of the focus bias for that layer prior to the start of data reproduction.
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> In this manner, the automatic adjustment of focus bias is more efficiently initiated after the objective lens has been initially positioned by a layer jump control circuit with respect to the jumped-to layer. In other words, Applicant's invention effectively provides a two-step process for adjusting focus bias for each layer. First, a pull-in position near the layer is efficiently reached by determining the intermediate value for the focus bias. Then, the focus servo operates to from the

pull-in position to determine the focus bias for the layer, thereby enabling the focus servo to operate over a reduced distance to establish the focus bias for the layer.

Ichimura discloses an apparatus for recording information on an optical medium by laser means. The apparatus of Ichimura determines the presence of spherical aberration by evaluating the relative value of a focus error signal at a time coincident with the arrival of a peak value of an envelope signal (see, e.g., column 9, lines 24 – 53 of Ichimura). Based upon the value of the focus error signal ("-", "0", "+"), a gap between a two-group objective lens is adjusted to minimize spherical aberration characteristic of a particular optical medium (see, e.g., column 10, lines 20 – 60).

This procedure disclosed by Ichimura is quite different from the method disclosed by Applicant's claimed invention. In Applicant's claimed invention, an intermediate value is calculated from a maximum value and a minimum value of the focus error signal with respect to one layer of the optical medium, and the calculated value is then used to set a pull-in position for initially pulling in the focus of the lens before turning on a focus servo for automatically adjusting the focus bias for the layer (see, e.g., page 9, line 21 – page 10, line 9, page 11, lines 10 – 20 and page 12, lines 1 – 14 of Applicant's specification). In this manner, automatic focus bias adjustment for a layer is efficiently carried out from a pull-in position near the focus position.

The Examiner suggests that, as Ichimura discloses multilayer optical disks, he necessarily discloses disk layer jumps (see, e.g., column 10, lines 56 – 60 of Ichimura). He also notes that Ichimura discloses a focus error signal taking an intermediate value between maximum and minimum values (see, e.g., column 10, lines 20 – 33). However, unlike Applicant's claimed invention, Ichimura does not teach or suggest calculating an intermediate value from minimum and maximum error signal values, and using the calculated intermediate value for setting a pull-in position to turn on a focus servo to execute an automatic adjustment of focus bias. Rather, Ichimura teaches measuring a focus error signal value at an envelope signal peak, evaluating the measured signal value, and adjusting a gap between two lens elements according to the measured value in order to reduce spherical aberration.

The Examiner acknowledges that Ichimura fails to disclose Applicant's claimed recorded-layer movement control means for calculating an intermediate value from a maximum value and a minimum value of a focus error signal corresponding to a recorded layer; and upon moving the focused position of the objective lens to the recorded layer, focus pull-in means for performing an automatic adjustment of focus bias when the focus error signal has corresponded

to the intermediate value. The Examiner suggests however that this limitation is suggested by Nagata. Applicants respectfully disagree.

Nagata discloses a tracking adjustment mechanism using maximum and minimum tracking error signals (see, e.g., abstract of Nagata). As described for example beginning at column 14, line 20 of Nagata:

> Referring to FIG. 13, another alternative embodiment of the present invention is shown and implemented as an optical data recording/reproducing apparatus capable of readjusting the change in focus due to aging. As shown, the embodiment has a focus offset adjusting section 270. Briefly, in response to a signal for servo control appearing at the beginning of focus servo or a sensed data signal appearing after the start of tracking servo, the focus offset adjusting section 270 determines a focus offset associated with the maximum or substantially maximum amplitude of the signal and readjusts the offset of focus servo by the determined focus offset.
>
> In the illustrative embodiment, at the start of the focus servo control which occurs after the turn-on of the power source or the loading of the disk 1 and with the optical pickup 10 having been located at the home position thereof and the disk being rotated, the focus offset adjusting section 270 detects the amplitudes of the signals adapted for focusing servo and tracking servo control or those of a sensed signal representative of recorded data. Then, the adjusting section 270 determines a focus offset at which the detected amplitude becomes maximum or substantially maximum and, based on the so determined focus offset, readjusts the focus servo offset. With the adjusting section 270, therefore, it is possible to automatically adjust the offset of focusing servo and to thereby insure accurate recording and playback over a long period of time.
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> Specifically, the focus offset adjusting section 270 is connected between the output of the amplifier 34 and the input of the amplifier 33. The adjusting section 270 automatically adjusts the focus servo offset, or focusing offset, such that the amplitude of the tracking error signal S34 appearing at the start of the focusing servo control and when only the focusing servo control is effective does the amplitude become maximum or substantially maximum. As shown in FIG. 13, the adjusting section 270 has an optimal offset calculating unit 273 and an offset setting unit 274. The optical offset calculating unit 273 calculates an optical focus servo offset in response to the output of the MAX.multidot.MIN calculating section 72. The offset setting unit 274 is implemented by a D/A converter and feeds, on the basis of the output of the calculating unit 273, an output signal S274 thereof to the amplifier 33 to set a focus servo offset. The MAX.multidot.MIN calculating section 72 and optimal offset calculating section 273 may be

constituted by calculators or similar independent circuits or may be implemented by a program control stored in a CPU.

(Emphasis added)

Thus, Nagata fails to teach Applicant's the limitations of independent claims 1, 2, and 4 – 6 requiring means for obtaining an intermediate value from a maximum value and a minimum value of a focus error signal which corresponds to defocusing of the objective lens, and to turn on a focus servo which pulls in a focus of the objective lens, with a bias at which the focus error signal corresponds to the intermediate value, when a layer jump is made to another recorded layer.

In sharp contrast to Applicant's claimed invention, according the method taught by Nagata, a focus servo offset is adjusted such that an amplitude of the tracking error signal (difference between maximum and minimum tracking error signal values) reaches a maximum value (see, e.g., FIG. 17 of Nagata). Thus, unlike Applicant's claimed invention, the focus servo offset of Nagata is not adjusted based on an intermediate value from a maximum value and a minimum value of a focus error signal, and moreover, is not even adjusted based on a focus error signal.

As is further disclosed by Nagata, it is conventionally known to adjust a tracking servo offset on the basis of the sum or the mean value of the maximum and minimum values of a tracking error signal (see, e.g., column 10, line 61 – column 11, line 5 of Nagata). Because a tracking error may occur due to an eccentricity of the disk axis resulting from a shift in the disk center, setting the tracking servo offset according to maximum and minimum values of a tracking error signal enables the midpoints of adjacent tracks to be properly traced.

Because these midpoint values are not however necessarily optimal for setting the focus servo offset, Nagata teaches an alternate means for setting the focus servo offset that, unlike

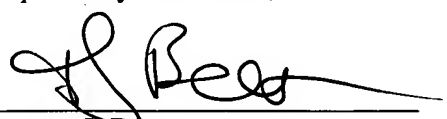
Applicant's claimed invention, is not based on an intermediate value of the focus error signal. Accordingly, Applicant respectfully submits that Applicant's claimed invention in not made obvious by the combination of Nagata and Ichimura, and that claims 1, 2, and 4 - 6 are allowable.

CONCLUSION

An earnest effort has been made to be fully responsive to the Examiner's objections. In view of the above amendments and remarks, it is believed that claims 1, 2 and 4 – 6 are in condition for allowance. Passage of this case to allowance is earnestly solicited. However, if for any reason the Examiner should consider this application not to be in condition for allowance, he is respectfully requested to telephone the undersigned attorney at the number listed below prior to issuing a further Action.

Any fee due with this paper may be charged on Deposit Account 50-1290.

Respectfully submitted,



Thomas J. Bean
Reg. No. 44,528

CUSTOMER NUMBER 026304
Katten Muchin Zavis Rosenman
575 Madison Avenue
New York, NY 10022-2585
(212) 940-8729
Docket No: SCET 19.104 (100809-00051)
TJB:pm